

WHAT IS CLAIMED:

1. A system for tracking multiple targets using distributed linear sensor arrays, comprising:
 - an plurality of arrays of sensors for receiving signals from a target;
 - 10 a receiver for receiving signals received by the plurality of sensor arrays;
 - an analog/digital converter for converting the signals received from the sensor arrays to a digital format, if signals are received in an analog format;
 - a digital storage device for storing the digitized data from the sensor arrays; and
 - 15 a computer system for retrieving the stored digitized data from the plurality of sensor arrays and processing the data through the use of a composite Hough transform to determine a track of the target.
2. A system for tracking multiple targets using distributed linear sensor arrays, comprising:
 - one or more arrays of sensors for receiving signals from a target;
 - 20 means for receiving signals received by the plurality of sensor arrays;
 - means for converting the signals received from the sensor arrays to a digital format, if required;
 - means for storing the digitized data from the sensor arrays; and
 - a computer system for retrieving the stored digitized data from the sensor arrays and
- 25 processing the data through the use of a composite Hough transform to determine a track of the

Inventor: Shyu
Serial No.

PATENT APPLICATION
Navy Case No. 79,739

5 target.

3. A system, as in Claim 2, wherein the sensors for receiving signals from a target are acoustic sensors.

10 4. A system, as in Claim 2, wherein the sensors for receiving signals from a target are electromagnetic sensors.

5. A system, as in Claim 2, wherein the sensors for receiving signals from a target are optic sensors.

15

6. A system, as in Claim 2, wherein the receiver is an acoustic receiver.

7. A system, as in Claim 2, wherein the receiver is an electromagnetic signal receiver.

20 8. A system, as in Claim 2, wherein the means for converting the signals received from the sensor arrays to a digital format, if required, is an analog-to-digital converter.

9. A system, as in Claim 2, wherein the means for storing the digitized data from the sensor arrays is a computer.

25

Inventor: Shyu
Serial No.

PATENT APPLICATION
Navy Case No. 79,739

- 5 10. A computer system for processing digitized data to determine the track of a target comprising;
 a data storage device; and
 a computer for retrieving data from the data storage device and computing
 hypothesizing a reference track relative to a primary sensor array;
10 hypothesizing a reference track relative to a primary sensor array;
 calculating an associated delay curve in a primary correlogram for the primary
 array;
 calculating an associated delay curve in a secondary correlogram for the secondary
 array;
15 accumulating data for the reference track by simultaneously integrating a series of
 pixel values along the appropriate delay curve in the primary and secondary correlograms;
 storing the accumulated pixel values in composite Hough space; and
 thresholding the accumulated pixel values to detect the track.

20 11. A computer system for processing digitized data to determine the track of a target comprising;
 a data storage device; and
 a computer for retrieving data from the data storage device and
 hypothesizing a track with track parameters values (θ_1 , v, D, t_{01});
25 generating a corresponding template delay curve in a primary correlogram;

Inventor: Shyu
Serial No.

PATENT APPLICATION
Navy Case No. 79,739

- 5 performing integration along the template delay curve in the primary correlogram;
- computing a delay curve parameter (θ_2 , v/D, t_{02}) for a secondary array based on geometric constraints;
- generating a corresponding template delay curve in a secondary correlogram based on the delay curve parameter (θ_2 , v/D, t_{02});
- 10 performing integration along the template delay curve in the secondary correlogram;
- computing a delay curve parameter (θ_{2m} , v/D_{2m}, t_{02m}) for the secondary array based on geometric constraints;
- generating a corresponding template delay curve in the secondary correlogram;
- 15 combining the integrated values and storing it in the corresponding composite Hough space; and
- thresholding the accumulated pixel values to detect the track.